United States Environmental Protection Agency | Air and Radiation (6202J) | EPA 430-F-97-028 December 2000

ENERGY STAR® LABELED PROGRAMMABLE THERMOSTATS

MECHANICAL EQUIPMENT IMPROVEMENTS

The U.S. Environmental Protection Agency's **ENERGY STAR® Program** promotes the use of high-efficiency technologies and equipment. ENERGY STAR labeled homes use at least 30% less energy than homes built to meet the national Model Energy Code while maintaining or improving indoor air quality. These fact sheets are designed to help consumers learn more about the energy-efficient improvements to their ENERGY STAR labeled homes.

Space heating and cooling systems are designed to maintain temperatures within an occupant defined range commonly referred to as the "comfort zone." Thermostats are devices that measure interior temperatures and turn these systems on and off according to the thermostat settings. Typically, thermostats are set between 65°F and 70°F for heating and 72°F and 78°F for cooling. These settings vary depending on the age of the occupants, their activity level, the relative humidity, the air tightness of the home, and the amount of window area.

Space heating and cooling accounts for more than 40 percent of the average home's energy use. A significant amount of this energy is often used to maintain interior temperatures within the comfort zone even when the home is unoccupied or when inhabitants are asleep. However, less heating and cooling is needed during these time periods.

ENERGY STAR labeled programmable thermostats can save energy and money without sacrificing comfort and convenience by reducing the amount of time heating and cooling systems operate. The occupants can program different temperature settings for different times of the day and days of the week based on how and when they use their homes. If programmed properly, the heating and cooling systems will operate less frequently, consume less energy, and lower utility bills.

ENERGY STAR labeled programmable thermostats have the following features:

Separate programs. This feature allows for different settings for different days of the week. ENERGY STAR labeled thermostats have a minimum of two programs (one for weekdays and one for weekends). Figures 1 and 2 show typical weekday and weekend settings for heating and cooling seasons. Some products have three (weekdays, Saturday and Sunday) or seven (one for each day of the week) programs.

Four time periods. Each ENERGY STAR labeled thermostat is preprogrammed to provide four time periods, two for periods of normal use (i.e. mornings and evenings) and two for periods of reduced need (i.e. work hours, sleep hours). The occupants can change the program temperature and time settings for each of these time periods.

Program override. This feature allows occupants to temporarily override the temperature settings without changing the programs. The settings can usually be overridden or restored with the touch of a button.

2° temperature band. This feature maintains comfort by limiting temperature swings to 2°F above and below the program settings.

FIGURE 1: SAMPLE HEATING SEASON SETTINGS

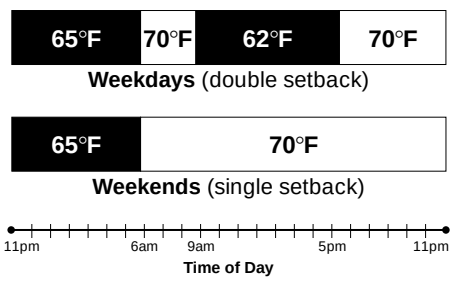
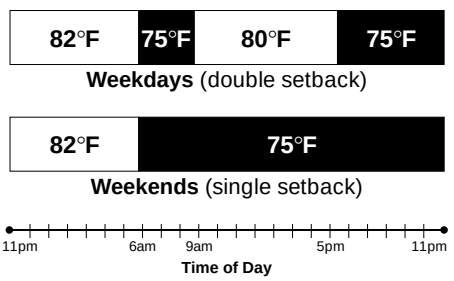


FIGURE 2: SAMPLE COOLING SEASON SETTINGS



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RESOURCES

The following fact sheets are available by calling the U.S. Environmental Protection Agency's toll-free ENERGY STAR Hotline at 1-888-STAR-YES (1-888-782-7937): ***ENERGY STAR Boilers, ENERGY STAR Furnaces, ENERGY STAR Air Conditioners,*** and ***ENERGY STAR Heat Pumps***.

Automatic and Programmable Thermostats fact sheet available from the Energy Efficiency and Renewable Energy Clearinghouse (EREC), P.O. Box 3048, Merrifield, VA 22116, 1-800-DOE-EREC (1-800-363-3732)

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Advanced recovery. This feature is needed in homes with heat pumps to minimize auxiliary heat use while allowing the more efficient heat pump cycle enough lead time to reach the program settings.

In addition to programmable thermostats, home owners can benefit from the installation of other ENERGY STAR labeled products such as air conditioners, boilers, furnaces, and heat pumps.

BENEFITS

Installing ENERGY STAR labeled programmable thermostats can provide many benefits including:

Improved comfort. ENERGY STAR labeled programmable thermostats maintain temperatures within 2°F of the occupant settings. This improves comfort by reducing temperature swings. In addition, ENERGY STAR labeled programmable thermostats can be set to change the temperature after the occupants are asleep and to reset the temperature just prior to their waking up. Manually resetting a thermostat can result in similar savings.

Convenience. ENERGY STAR labeled programmable thermostats operate automatically to provide the occupants with the temperature they want when they want it. Once programmed, the occupants do not have to remember to manually change thermostat settings.

Lower utility bills. The average home owner spends over $600 per year on space heating and cooling. ENERGY STAR labeled programmable thermostats can reduce this amount by 5 percent to 12 percent with a 5°F setback and 9 percent to 18 percent with a 10°F setback. These savings vary depending on climate conditions and occupant behavior.